

decrest.m

```
function [Cxde, th]=decrest(X,NUM_CHAN)

z=20*log10(max(abs(X))/rms(abs(X)));
disp(sprintf(' Baseband Peak to Average Ratio before decresting= %1.3f dB ',z));
%disp(sprintf(' rms of the original signal %1.0f ',rms(X)));
%disp(sprintf(' peak of the original signal %1.0f ',max(abs(X))));

amp=abs(X);
phase=angle(X);

if NUM_CHAN > 1
    fp=1.8e6;
    dec=6;
    th=rms(amp)*10^(dec/20);
    Be=firls(16, [0 fp fp+130e3 (1.2288e6*2)]/(1.2288e6*2), [1 1 0 0], [1 1e3]);
else
    fp=0.6e6;
    dec=4.1;
    th=rms(amp)*10^(dec/20);
    Be=firls(16, [0 fp fp+130e3 (1.2288e6*2)]/(1.2288e6*2), [1 1 0 0], [1 1e3]);
end

%disp(sprintf(' threshold %1.0f ',th));
%Decresting filter
Be=Be/max(Be);
Bx=zeros(16,1); Bx(16/2+1)=1;

%First stage Decresting
I=find(amp<=th);
Er(I)=0;
J=find(amp>th);
Er(J)=amp(J)-th;
%disp(sprintf(' rms of the peak signal %1.0f ',rms(Er)));

Er2=[Er(2:end) Er(1)];
Er3=[Er(end) Er(1:end-1)];
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% find the local peak

K=find(Er>Er2 & Er>Er3);
E=zeros(size(Er));
E(K)=Er(K);
E=E.*exp(j*phase);

E1=filter(Be,1,E);
X=filter(Bx,1,X);
X=X-E1;

k=find(abs(X)>th);
%disp(sprintf(' Number of peaks not decrested = %ld ',length(k)));
%figure; plot(filter(Bx,1,abs(Er))); hold on; plot(abs(filter(Be,1,E)),'r--'); %plot((filter(Bx
,1,abs(Er))-(abs(filter(Be,1,E)))),'g--');

z=20*log10(max(X)/rms(X));
%disp(sprintf(' Baseband Peak to Average Ratio after first decresting= %1.3f dB ',z));

%Second stage Decresting
amp=abs(X);
signal
phase=angle(X);

I=find(amp<=th);
Er(I)=0;
J=find(amp>th);
Er(J)=amp(J)-th;

Er2=[Er(2:end) Er(1)];
Er3=[Er(end) Er(1:end-1)];
K=find(Er>Er2 & Er>Er3);
E=zeros(size(Er));
E(K)=Er(K);
E=E.*exp(j*phase);

E2=filter(Be,1,E);
X=filter(Bx,1,X);

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% the amplitude of the

% find the local peak

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CxdE=X-E2;

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k=find(abs(Cxde)>th);
disp(sprintf(' Number of peaks not decrested = %ld ',length(k)));
%figure; plot(filter(Bx,1,abs(Er))); hold on; plot(abs(filter(Be,1,E)), 'r--'); plot((filter(Bx,
1,abs(Er))-(abs(filter(Be,1,E)))) , 'g--');

z=20*log10(max(Cxde)/rms(Cxde));

disp(sprintf(' rms of the error signal %1.0f ',sqrt(rms(E1)^2+rms(E2)^2)));
%disp(sprintf(' rms of the decrested signal %1.0f ',rms(Cxde)));
%disp(sprintf(' peak of the decrested signal %1.0f ',max(abs(Cxde))));
disp(sprintf(' Baseband Peak to Average Ratio after second decresting= %1.3f dB ',z));

```